possible, change his occupation from a sedentary to an active one. Regular exercise should be taken, horseback riding, cycling and golf being the best. He should follow the diet above outlined; drink quantities of water for the purpose of diluting the bile.

STITCH HOLE ABSCESS.

By J. HENRY BARBAT, M. D., San Francisco.

IT MIGHT seem superfluous to the average operator to bring up the matter of wound infection following clean operations with our present knowledge of surgical technic, but in reviewing the work of a number of our surgeons I have been surprised to find a large number of so-called "stitch-hole abscesses" following "clean" operations. It is customary in the majority of cases to lay the blame on the suture materials or the operating-room nurse, or anything which will tend to shield the operator himself from odium of this almost unnecessary accident.

The records of men of large operative experience show not more than 1% or 2% of superficial infections following clean operations, and in the majority of cases these can be traced to some inherent condition of the patient, usually reduced resistance due to the disease or loss of blood. Why then do so many men have stitch-hole abscesses in a large proportion of their operative cases? The answer is easy.

Let us first glance over the various possible means of infection outside of the operator and his assistants. The field of operation. The operating room. Dressings and sponges. Instruments. Ligatures and sutures.

It is a well recognized fact that it is practically impossible to obtain a field of operation which is free from germs, and even with the most rigid antiseptic technic the *staphylococcus epidermidis albus* is found in the deep layers of the skin, usually at the bottom of the hair follicles. Naturally the number of germs over any given area will vary to a great extent with the method adopted in cleaning the skin before operating, but it can be shown that the presence of a few normal inhabitants of the skin rarely gives rise to stitch-hole abscess unless assisted by some error in operative technic.

Numerous tests have been made to determine the presence and number of germs in the air of operating rooms, and it has been shown that bacteria are found in the air of all operating rooms within a short time after the doors and windows have been opened, following disinfection; and the number depends largely on the number and cleanliness of the persons entering the room. The air nearest the floor contains the largest number of germs on account of the dust carried in on the shoes and kept in circulation by the motion of the feet. Near the ceiling the air is comparatively free from germs. Operating rooms which are situated near the ground floor contain many more bacteria than those which are considerably elevated. The furniture of any modern well-kept operating room will be found free from germs previous to any operation, and there should be no likelihood of infection from that source.

All dressings and sponges are necessarily sterile after having been submitted for 30 minutes to a moist heat of 250° Fahrenheit.

The instruments are boiled and therefore sterile.

Suture and ligature materials have always come in for the largest share of blame for infections because the operator has often been able to remove a suture or ligature several days after the operation, which could be shown to contain some form of pus producing bacterium, and was forthwith declared to be the cause of the disaster. As a matter of fact I have never seen a piece of prepared suture or ligature material which was removed from its original package under proper precautions, that would give one colony on glycerine agar or blood serum; aërobes or anerobes. These tests have been made hundreds of times in the various hospitals with which I have been connected during the past 12 years. We must therefore look to something besides the operating room and its appurtenances as a cause of stitch-hole abscess.

Operating room nurses, properly trained, properly gowned, wearing correct head-gear and rubber gloves, cannot be considered as sources of infection as they do not come in contact with the wound unless acting as assistants, and they should then wear face masks. The greatest danger from the nurse is in the conveyance of instruments, ligatures and sponges to the operator or assistants. I have seen ligatures and sutures trailed over the shoulder of the operator who had a few minutes previously wiped his nose or chin on his gown at the identical spot touched by the ligature.

We now come to the operator himself and his assistants. From actual observation less than half the men who operate have acquired the habit of aseptic technic. Let the slightest thing go amiss during the course of the operation and asepsis is forgotten, materials are handled which are not sterile and the soiled hands plunged into the wound without a thought of the consequences. These gentlemen invariably blame everybody but themselves if infection supervenes. I have seen operators with large reputations wash their hands carefully, and while waiting for the patient, adjust their glasses, wipe their noses on the operating gown, and actually in one case place the finger in the ear.

The modern surgeon will tell me that these men are not to be classed as surgeons and should not operate, but unfortunately they do, and their results are just what we would expect; yet they have reputations as surgeons among the laity. How unjust it is for the operator to blame a ligature for producing a stitch-hole abscess when he has allowed the perspiration from his forehead or nose to drop into the wound, or has blown particles of germ laden saliva on the field of operation, or has dropped a few hairs from his head or face into the adominal cavity.

I have seen these things happen without the slightest attention being paid to them. I have repeatedly seen a pair of scissors with which an infected appendix has been cut, dropped among the other instruments and subsequently used to cut ligatures with. Must we not expect infection of our wounds if a gangrenous appendix is dragged through without proper protection? These errors of technic and many others I regret to say are being constantly committed by men who cut for disease and incidentally for money, and whose results are anything but elegant. In hospitals where men of this type habitually operate, all the attendants become careless and it is unusual to have wounds heal by first intention.

The assistant, unless he has been thoroughly trained and constantly employed, becomes careless and forgetful of his asepsis and jeopardizes the results of the most careful surgeon. Naturally, anyone who has the misfortune to assist regularly any chief who is not thoroughly clean in his work, will acquire the same bad habits as the one whom he assists, and is a dangerous person to have around during an operation. Assistants frequently become careless of their asepsis, when during the course of an operation their active service is not required for a few minutes, as during the separation of adhesions by the operator or when waiting to apply a ligature; and I have frequently seen a catgut ligature repeatedly drawn between the partially cleaned fingers of the assistant previous to its application.

How often do we see assistants using a sponge which has already been touched to an infected area, thereby spreading, instead of removing the infectious materials. What is the remedy for this state of affairs? First, of course, students must be properly taught, and in these days when surgery is done by the majority of practitioners, especial stress should be laid on the tremendous responsibilities which are

assumed by every individual who takes up the scalpel as a means of livelihood.

I regret to say that some of the gentlemen whose asepsis in the operating room has been open to serious criticism, have been recent graduates whose teaching, I am positive, has been forgotten or never understood. Recent graduates of recognized medical colleges should have, theoretically, an almost perfect aseptic technic. Any individual who has had the advantages of a course in a modern bacteriological laboratory cannot but appreciate the serious results which are liable to follow the slightest error in asepsis. Why is it, then, that these recent graduates forget their teaching? Simply from lack of having acquired the "aseptic habit." Unless a person be in constant touch with operating room work, he is liable to become careless and endanger the lives of patients who have the misfortune to be operated upon with his assistance.

No individual should attempt to operate who does not keep in constant training, either as an operator or an assistant, because his results will be bad, and he will bring legitimate surgery into disrepute.

Stitch-hole abscesses are usually caused by the poor technic of the operator or his assistants.

EXTRA-UTERINE PREGNANCY. *

By R. A. WHIFFEN, M. D., San Jose.

MY INCENTIVE to bring the subject of extra-uterine pregnancy before the society for discussion was originally a difference of opinion between Dr. Howard Gates and myself in regard to a patient on whom we operated at the County Infirmary.

Since I have had the pleasure of assisting Dr. Gates at an operation upon a case of tubal pregnancy at the San Jose Sanitarium, a description of which I will give you.

Extra-uterine pregnancy dates back in surgical history to the eleventh century in all probability, and from that time down to the present cases have been reported at intervals of from two hundred years to a few days.

What interests us more than history is the present knowledge of this development of the fertilized ovum outside of the uterine cavity, and of this knowledge I shall make as brief a statement as possible.

Many theories are advanced as to the cause of this condition, the most feasible ones being: polypi in the Fallopian tube; atresia of one tube with external migration of the fertilized ovum or the spermatozoa from the opposite side; persistence of a foetal type of uterine tube; diverticula from the lumen of the tube; torsion of the tube; catarrhal and purulent salpingitis; myoma of the uterus or in the tubal walls; peritoneal bands and adhesions compressing the tube; cervico-abdominal fistula after hysterectomy; any one of which may be a cause in some particular case.

With these various causes it can readily be understood that the ovum may develop in a number of locations as the following classification will show: First, ovarian pregnancy, divided into internal when the ovum remains in the Graffian follicle and external when the ovum develops partly in the follicle and partly in the peritoneal cavity. Edgar states that this occurs in 4.8 per cent of all cases, while other authors—Williams, for instance—consider that it occurs less frequently. Second, abdominal or peritoneal pregnancy, divided into primary, in which the ovum falls into Douglas cul-de-sac and stays fixed there from the beginning; secondary, when the ovum begins its growth in the tube or ovary and by aborting from the tube or rupture of the tube or ovarian sac, the placenta still being retained in position wholly or partially, finally falls into the peritoneal cavity, where it continues its growth. Edgar states that this form occurs in 8.5 per cent of all cases. Other authors dispute the existence of a primary abdominal pregnancy, claiming that all abdominal cases can be proved to be secondary. Third, tubal pregnancy, divided into tubo-abdominal, in which the ovum increases partly in the tube and partly in the abdominal cavity; tubo-ovarian, in which the ovum is between the fimbriated end of the tube and the ovary; tubal pregnancy proper, in which the ovum is fixed about the middle of the tube; interstitial tubal pregnancy, in which the ovum is developed in that part of the tube which is connected with the uterine wall. This third class is by far the most common form, and Edgar states occurs in 86.7 per cent of all cases.

A little thought regarding the above classification, taking into consideration the anatomy of the parts involved, will be explanatory in itself.

We are most interested in the complications which arise, as they are really what do the damage to the patient.

The most important complications are a rupture of the tube from which the foetus may be expelled into the abdominal cavity, and if the placenta is still retained in its original site the foetus may continue to develop. The same thing may practically occur by the end of the tube being forced open and the foetus expelled, this latter being called tubal abortion. There might not be much hemorrhage in the above-mentioned condition, but the shock would be great. If, however, the placenta loosens partly or wholly (which is most apt to occur), there would be severe hemorrhage and in all probability collapse and possibly death of the woman in a very short time. If the woman does not die and an operation is performed at this time, the chances of recovery may be very good, but if nothing is done and the woman lives we will have an accumulation of clotted blood in the pelvis or between the layers of the broad ligament, forming a hematocele which may partly absorb, but there is always the possibility of infection in such a case, especially if the hematocele is in contact with the bowels, and then the dangers of pelvic abscess would be added.

Another condition that might develop is that the fetus and blood clots or the sac containing the foetus and placenta might be walled off in the abdominal cavity in contact with the bowels and by pressure on the bowels cause a necrosis at some point and rupture into the bowel, thereby creating another condition that is apt to prove fatal on account of hemorrhage into the bowel.

Very rarely the rupture of one of these pregnancies has been through the abdominal wall or into the bladder.

The one form of rupture of an extra-uterine pregnancy that does not cause trouble is the interstitial tubal pregnancy when it ruptures into the uterus.

The worst complication, in all probability, as far as the surgeon is concerned, is to be found when the growth has continued for several months before coming to operation and a great many adhesions have formed involving the bowels in the general mass, so that its removal is almost impossible on account of hemorrhage from large adherent surfaces.

In cases that have lived and never come to operation and in some that have gone to full term the records show that some of the foeti have become lithopoedians, remaining in the abdomen as long as fifty-five years; others have become encysted, and still others have formed abscesses which have been drained and the patients seemed to get along all right; still the dangers and suffering that attend such cases are uncalled for and should be avoided. It is only in the last twenty to twenty-five years that these cases have been treated surgically and in that time the mortality has been cut down enormously, so that at the present day treatment, such as electricity or the injection of poisonous fluids, to kill the foetus should absolutely be a thing of the past, and the surgeon called upon to operate as soon as a diagnosis is made. It is seldom that a diagnosis is made until the patient is in a bad state, as the woman herself does not realize her serious condition, and if she has

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